

Metal Industry Indicators

Indicators of Domestic Primary Metals, Steel, Aluminum, and Copper Activity

October 2001

In the aftermath of the September 11 terrorist attacks, gauging what will happen in the economy and the primary metals industry is especially difficult. Federal Reserve Chairman Alan Greenspan expressed the difficulty in recent testimony before Congress when he said, “Nobody has the capacity to fathom fully how the effects of the tragedy of September 11 will play out in our economy.” However, the earliest available indicators in the September primary metals leading index point to a falloff in metals activity in the coming months.

The **primary metals leading index** fell 1.3% in September to 124.0 from a revised 125.6 in August. The index's 6-month smoothed growth rate, a compound annual rate that measures the near-term trend, moved down to -0.5% from a revised 1.9% in August. Normally, a growth rate below -1.0% signals a downward near-term trend for future growth in metals activity, while a growth rate above +1.0% signals an upward trend.

Only four of the index's eight components were available in time to calculate an early estimate of the leading index, so the September index value should be considered preliminary. Three of the four available components, the S&P stock price index for diversified machinery companies, the Purchasing Managers' Index, and the metals price index growth rate, moved down in September. However, the component measuring the length of the average workweek in primary metals establishments posted an increase.

Prior to September, the primary metals leading index seemed to be pointing to increased growth in metals activity around the end of this year. However, the September leading index suggests that recovery will be delayed until after the new year.

The other metal industry indexes are available only through August, and thus do not reflect the aftermath of the September 11 terrorist attacks. The **steel leading index** posted a strong 1.6% increase in August, advancing to 111.7 from a revised 109.9 in July. The index's 6-month smoothed growth rose to 6.9% in August, its highest growth rate since April 1994. Deflated shipments of household appliances, which posted their largest increase in 24 years, were responsible for most of the gain in the leading index. The Purchasing Managers' Index accounted for most of the rest of the increase. However, with other economic indicators, such as total industrial production, weakening in September, it may be a while before steel industry activity picks up.

The **aluminum mill products leading index** dipped 0.2% in August to 166.6 from a revised 167.0 in July. Meanwhile, the index's 6-month smoothed growth rate slowed to 6.8% from a revised 8.6% in July. Only two of the index's seven components moved down in August, but one of those components, the length of the average workweek in aluminum sheet, plate, and foil establishments, registered a 2.3-hour decrease, the second largest decrease in this indicator's nearly 30-year data history. The growth rate of the leading index, which declined for the second straight month in August, suggests slower growth in aluminum mill products activity in the months ahead.

The **primary aluminum leading index** decreased 0.5% in August to 85.1 from a revised 85.5 in July. The index's 6-month smoothed growth rate slowed to -3.8% from a revised -3.5% in July. Four of the leading index's six components moved down, with the S&P stock price index for aluminum companies posting the largest negative contribution to the leading index. The growth rate of the August primary aluminum leading index continued to signal a downward near-term trend in domestic primary aluminum activity. (Tables and charts for the primary aluminum indexes are in a separate file.)

The **copper leading index** increased 0.5% in August, rising to 115.0 from a revised 114.4 in July, and the index's 6-month smoothed growth rate pushed above +1.0% for the first time in almost 2 years, climbing to 1.7% from a revised 0.4% in July. Most of the strength in the index came from just one component, average weekly overtime hours in copper rolling, drawing, and extruding establishments. The only other component to register a sizable increase in August was the S&P stock price index for building materials companies. As with other metals, the outlook for copper in the near term will be affected by industrial production in the last quarter of this year.

Latest Metals Price Leading Index Moves Higher But Could Decline in the Months Ahead

Based on information through August, the metals price leading index and the growth rate of U.S. nonferrous metal products inventories were pointing to the possibility of higher prices for some metals in the months ahead. However, growth in metal prices may decline because of falling industrial activity that is not currently reflected in the latest indicators.

In August, the **metals price leading index** posted its fourth increase in the past 5 months, climbing 1.2% to 105.4 from a revised 104.1 in July. The index's 6-month smoothed growth rate rose to 5.1%, a 30-month high, up from a revised 2.8% in July. Three of the index's four components were available for the August index calculation. The index measuring the exchange value of other major currencies against the U.S. dollar provided

most of the strength in the leading index. The growth rate of the inflation-adjusted value of new orders for nonferrous metal products rose modestly, while the yield spread between the U.S. 10-year Treasury Note and the federal funds rate moved lower.

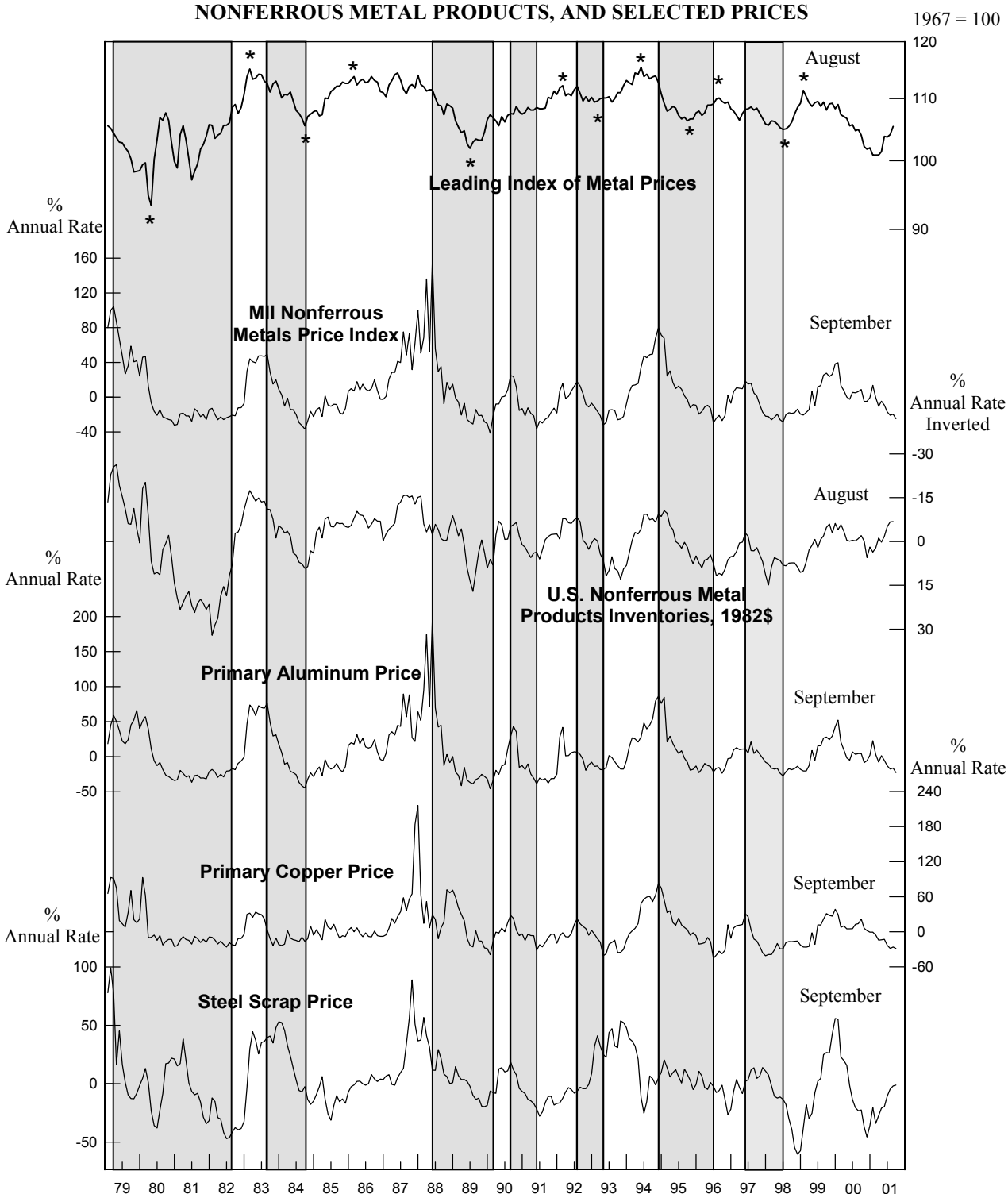
The fourth metals price leading index component, the growth rate of the Economic Cycle Research Institute's (ECRI) 16-Country Long Leading Index, was available only through July. While it eased off its highest reading for the year in July, it will be a few months before this component reflects the impact of the September 11 attacks.

The 6-month smoothed growth rate of the inflation-adjusted value of U.S. nonferrous metal products inventories slipped to -6.8% in August from a revised -6.7% in July. That is the lowest growth rate for this indicator in 6½ years. The actual level of these inventories is the lowest since November 1997. These inventories usually move inversely with prices.

Table 1.
Leading Index of Metal Prices and Growth Rates of the Nonferrous Metals Price Index, Inventories of Nonferrous Metal Products, and Selected Metal Prices

	Leading Index of Metal Prices (1967=100)	Six-Month Smoothed Growth Rates				
		MII Nonferrous Metals Price Index	U.S. Nonferrous Metal Products Inventories (1982\$)	Primary Aluminum	Primary Copper	Steel Scrap
2000						
August	104.9	6.6	-1.0	4.4	13.9	-23.2
September	104.0	8.9	-2.0	4.5	21.7	-22.4
October	102.2	-4.9	-0.1	-8.4	5.7	-37.0
November	101.8r	-4.7	5.5	-5.7	1.8	-45.6
December	102.0r	-0.5	1.9	2.1	-0.7	-35.9
2001						
January	100.9r	13.7	3.6	22.7	-0.8	-20.4
February	100.9	-0.5	2.2	3.0	-5.8	-34.0
March	100.9r	-10.5	-1.2	-7.8	-14.4	-27.2
April	101.4r	-4.5	0.2r	1.5	-13.8	-21.0
May	103.8r	-9.0	-1.8r	-5.3	-12.8	-19.5
June	103.7r	-17.0	-5.1	-13.1	-23.3	-10.6
July	104.1r	-20.9	-6.7r	-17.7	-28.5	-4.5
August	105.4	-19.4	-6.8	-16.2	-26.1	-2.0
September	NA	-24.7	NA	-22.7	-28.7	-1.2
<i>NA: Not available r: Revised</i>						
Note:	The components of the Leading Index of Metal Prices are the spread between the U.S. 10-year Treasury Note and the federal funds rate, and the 6-month smoothed growth rates of the deflated value of new orders for nonferrous metal products, the Economic Cycle Research Institute's 16-Country Long Leading Index, and the reciprocal of the trade-weighted average exchange value of the U.S. dollar against other major currencies. The Metal Industry Indicators (MII) Nonferrous Metals Price Index measures changes in end-of-the-month prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange (LME). The steel scrap price used is the price of No. 1 heavy melting. Inventories consist of the deflated value of finished goods, work in progress, and raw materials for U.S.-produced nonferrous metal products (NAICS 3313, 3314, & 335929). Six-month smoothed growth rates are based on the ratio of the current month's index or price to its average over the preceding 12 months, expressed at a compound annual rate.					
Sources:	U.S. Geological Survey (USGS); American Metal Market (AMM); the London Metal Exchange (LME); U.S. Census Bureau; the Economic Cycle Research Institute, Inc. (ECRI); and Federal Reserve Board.					

**CHART 1.
LEADING INDEX OF METAL PRICES AND GROWTH RATES
OF NONFERROUS METALS PRICE INDEX, INVENTORIES OF
NONFERROUS METAL PRODUCTS, AND SELECTED PRICES**



Shaded areas are downturns in the nonferrous metals price index growth rate. Asterisks (*) are peaks and troughs in the economic activity reflected by the leading index of metal prices. Scale for nonferrous metal products inventories is inverted.

Table 2.
The Primary Metals Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2000				
October	123.6	-7.4	114.9	-3.2
November	123.5	-6.7	114.1	-4.4
December	122.9	-6.8	112.2	-7.1
2001				
January	123.2	-5.3	111.7	-7.2
February	122.6	-5.2	110.5	-8.3
March	123.3	-3.4	109.7	-8.7
April	124.6	-0.9	110.4	-6.6
May	125.1	0.6r	110.1	-6.2r
June	125.5r	1.4r	109.1	-6.7r
July	125.2r	1.2r	109.1r	-5.7r
August	125.6r	1.9r	108.4	-5.8
September	124.0	-0.5	NA	NA

NA: Not available r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 3.
The Contribution of Each Primary Metals Index Component to the Percent Change in the Index from the Previous Month

Leading Index	August	September
1. Average weekly hours, primary metals (SIC 33)	-0.3r	0.7
2. S&P stock price index, machinery, diversified	0.1r	-1.6
3. Ratio of price to unit labor cost (SIC 33)	0.1	NA
4. JOC-ECRI metals price index growth rate	-0.1r	-0.1
5. New orders, primary metal products, (NAICS 331 & 335929) 1982\$	-0.1	NA
6. Index of new private housing units authorized by permit	0.0	NA
7. Growth rate of U.S. M2 money supply, 1996\$	0.0	NA
8. Purchasing Managers' Index	0.6r	-0.2
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.3r	-1.2
Coincident Index	July	August
1. Industrial production index, primary metals (SIC 33)	0.0	-0.2
2. Total employee hours, primary metals (SIC 33)	-0.4r	-0.5
3. Value of shipments, primary metals products, (NAICS 331 & 335929) 1982\$	0.3	0.0
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.0r	-0.6

Sources: Leading: 1, Bureau of Labor Statistics; 2, Standard & Poor's; 3, U.S. Geological Survey; 4, Journal of Commerce and Economic Cycle Research Institute, Inc.; 5, U.S. Census Bureau and U.S. Geological Survey; 6, U.S. Census Bureau and U.S. Geological Survey; 7, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 8, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey; 3, U.S. Census Bureau and U.S. Geological Survey. All series are seasonally adjusted, except 2, 3, and 4 of the leading index.

NA: Not available r: Revised

Note: A component's contribution, shown in Tables 3, 5, 7, and 9, measures its effect, in percentage points, on the percent change in the index. Each month, the sum of the contributions plus the trend adjustment equals (except for rounding differences) the index's percent change from the previous month.

CHART 2.

PRIMARY METALS: LEADING AND COINCIDENT INDEXES, 1979-2001 1977=100

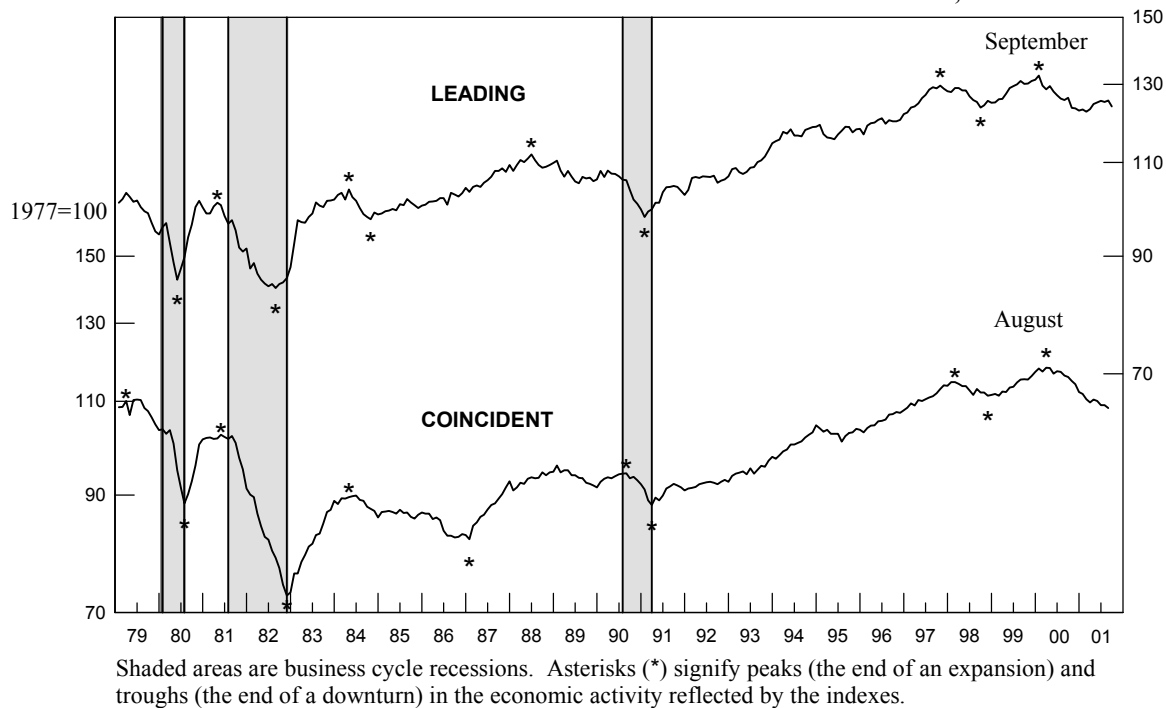


CHART 3.

PRIMARY METALS: LEADING AND COINCIDENT GROWTH RATES, 1979-2001 Percent

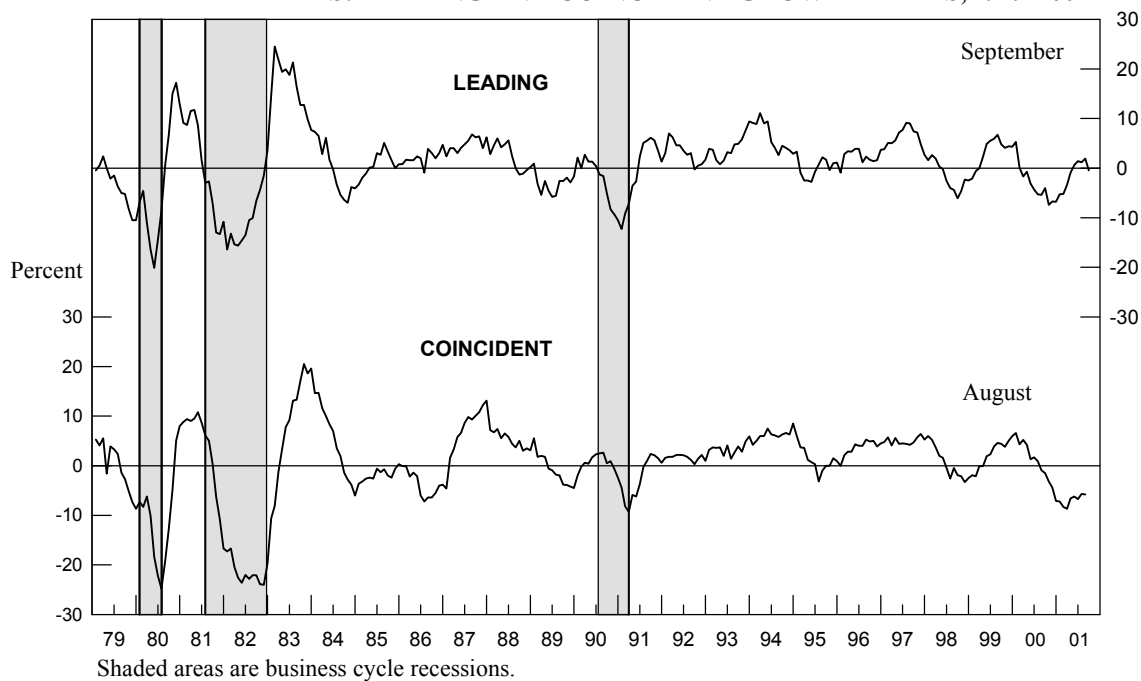


Table 4.
The Steel Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2000				
September	108.4	-5.4	103.1	-1.9
October	106.1	-8.8	102.0	-3.9
November	106.1	-8.0	101.4	-4.6
December	105.3	-8.2	99.7	-7.2
2001				
January	106.4	-5.3	99.3	-7.3
February	106.5	-3.9	98.9	-7.2
March	107.6	-1.1	98.8	-6.6
April	108.7	1.4r	99.5	-4.5
May	109.5r	3.1r	100.0	-2.9
June	110.4r	4.9	99.5	-3.1
July	109.9r	3.9r	99.2r	-2.9r
August	111.7	6.9	99.3	-2.0

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 5.
The Contribution of Each Steel Index Component to the Percent Change in the Index from the Previous Month

Leading Index	July	August
1. Average weekly hours, blast furnaces and basic steel products (SIC 331)	-0.3r	0.1
2. New orders, iron and steel mills (NAICS 3311 & 3312), 1982\$	-0.2r	-0.1
3. Shipments of household appliances, 1982\$	0.2r	0.9
4. S&P stock price index, steel companies	-0.1	0.0
5. Retail sales of U.S. passenger cars and light trucks (units)	-0.2	0.0
6. Growth rate of the price of steel scrap (#1 heavy melting, \$/ton)	0.1	0.1
7. Index of new private housing units authorized by permit	-0.1	0.0
8. Growth rate of U.S. M2 money supply, 1996\$	0.2	0.0
9. Purchasing Managers' Index	-0.2	0.6
Trend adjustment	0.0	0.0
<hr/>		
Percent change (except for rounding differences)	-0.4r	1.6
Coincident Index		
1. Industrial production index, basic steel and mill products (SIC 331)	-0.1r	-0.1
2. Value of shipments, iron and steel mills (NAICS 3311 & 3312), 1982\$	0.3	0.0
3. Total employee hours, blast furnaces and basic steel products (SIC 331)	-0.6r	0.1
Trend adjustment	0.1	0.1
<hr/>		
Percent change (except for rounding differences)	-0.3r	0.1

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, U.S. Census Bureau and U.S. Geological Survey; 4, Standard & Poor's; 5, U.S. Bureau of Economic Analysis and American Automobile Manufacturers Association; 6, Journal of Commerce and U.S. Geological Survey; 7, U.S. Census Bureau and U.S. Geological Survey; 8, Federal Reserve Board, Conference Board, and U.S. Geological Survey; and 9, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, U.S. Census Bureau and U.S. Geological Survey; 3, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted, except 4 and 6 of the leading index.

r: Revised

CHART 4.
STEEL: LEADING AND COINCIDENT INDEXES, 1979-2001

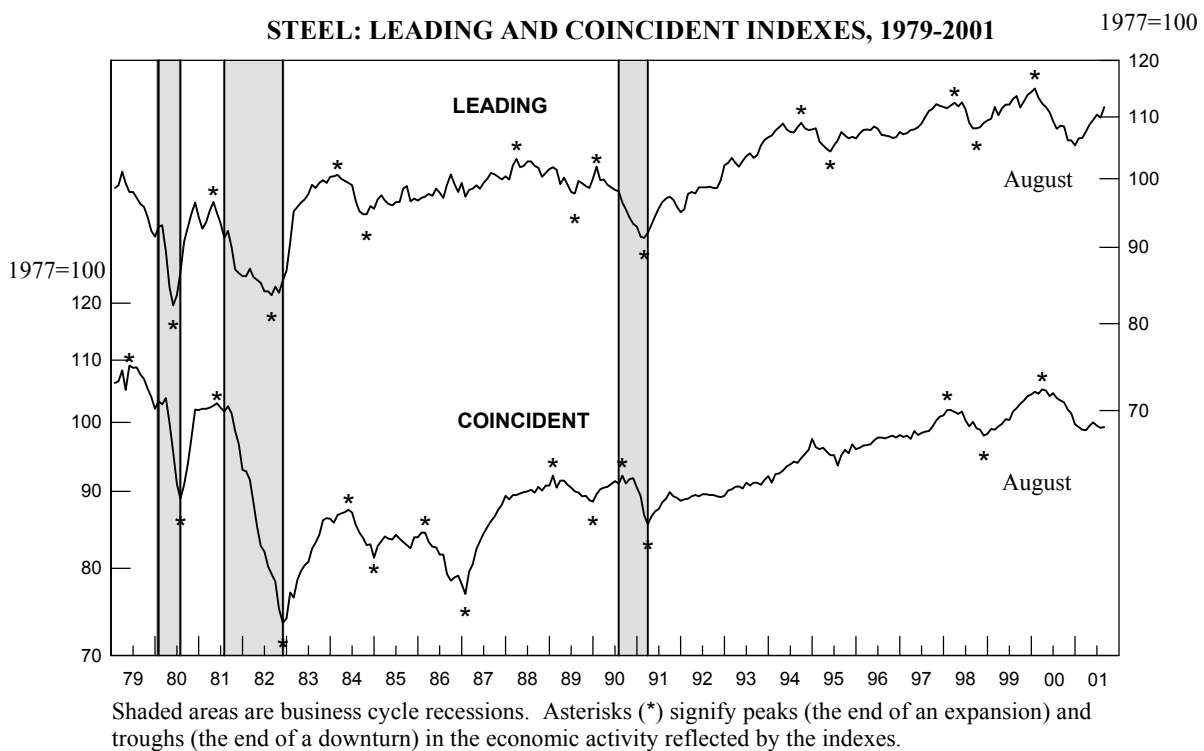


CHART 5.
STEEL: LEADING AND COINCIDENT GROWTH RATES, 1979-2001

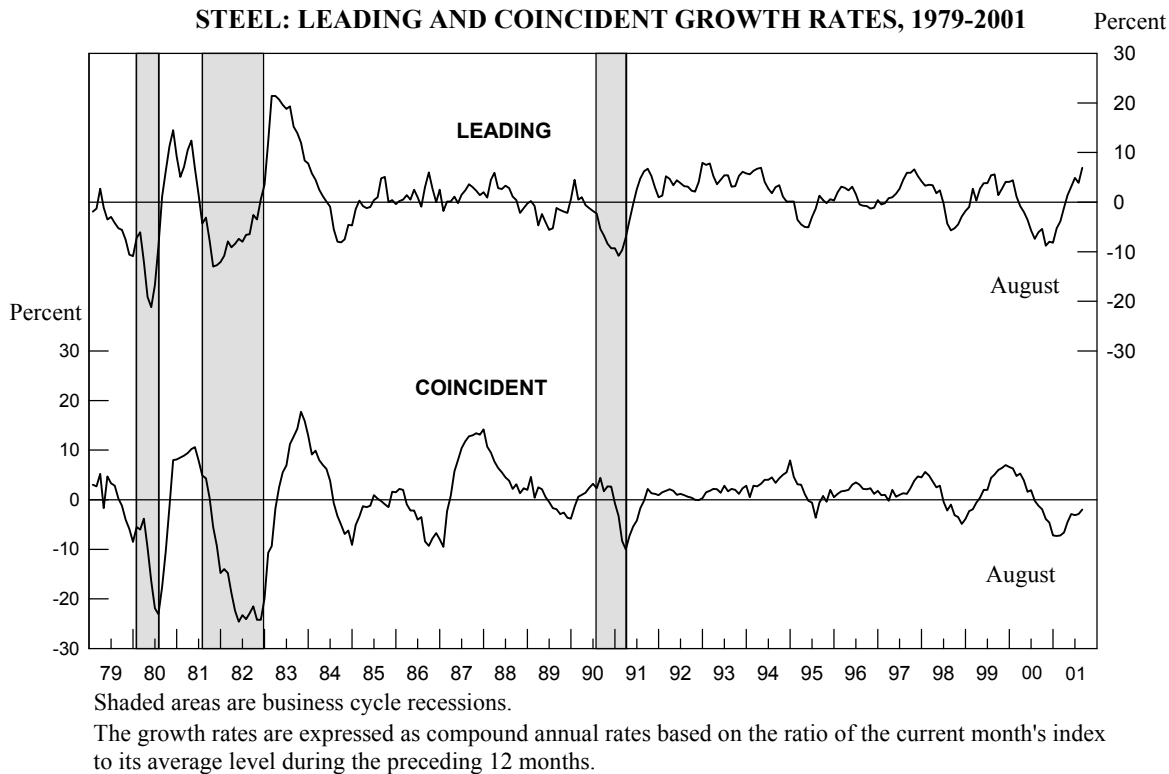


Table 6.
The Aluminum Mill Products Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2000				
September	158.5	1.2	142.5	-2.1
October	155.0	-2.9	142.0	-2.8
November	155.9	-1.7	139.8	-5.4
December	157.0	-0.3	144.0	0.1
2001				
January	160.2	3.6	146.0	2.7
February	161.8	5.4	142.9	-1.3
March	162.2	5.7	142.0	-2.4
April	164.7	8.3	149.0	7.0
May	163.4	6.1	146.8	3.7
June	166.8r	9.4r	143.3	-1.0
July	167.0r	8.6r	145.2r	1.6r
August	166.6	6.8	141.6	-3.0

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 7.
The Contribution of Each Aluminum Mill Products Index Component to the Percent Change in the Index from the Previous Month

Leading Index	July	August
1. Average weekly hours, aluminum sheet, plate, and foil (SIC 3353)	0.9r	-1.3
2. Index of new private housing units authorized by permit	-0.1	0.0
3. Retail sales of U.S. passenger cars and light trucks (units)	-0.3r	-0.1
4. Construction contracts, commercial and industrial (square feet)	-0.2	0.0
5. Net new orders for aluminum mill products (pounds)	-0.6r	0.2
6. Growth rate of U.S. M2 money supply, 1996\$	0.3	0.0
7. Purchasing Managers' Index	-0.2	0.7
Trend adjustment	0.2	0.2
Percent change (except for rounding differences)	0.0r	-0.3
Coincident Index		
1. Industrial production index, aluminum sheet, plate, and foil (SIC 3353)	0.5	-0.2
2. Total employee hours, aluminum sheet, plate, and foil (SIC 3353)	0.6r	-2.5
Trend adjustment	0.2	0.2
Percent change (except for rounding differences)	1.3r	-2.5

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, U.S. Bureau of Economic Analysis and American Automobile Manufacturers Association; 4, F.W. Dodge, Division of McGraw-Hill Information Systems Company; 5, The Aluminum Association, Inc. and U.S. Geological Survey; 6, Federal Reserve Board, Conference Board, and U.S. Geological Survey; 7, National Association of Purchasing Management. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics and U.S. Geological Survey. All series are seasonally adjusted.

r: Revised

CHART 6.
ALUMINUM MILL PRODUCTS:
LEADING AND COINCIDENT INDEXES, 1979-2001

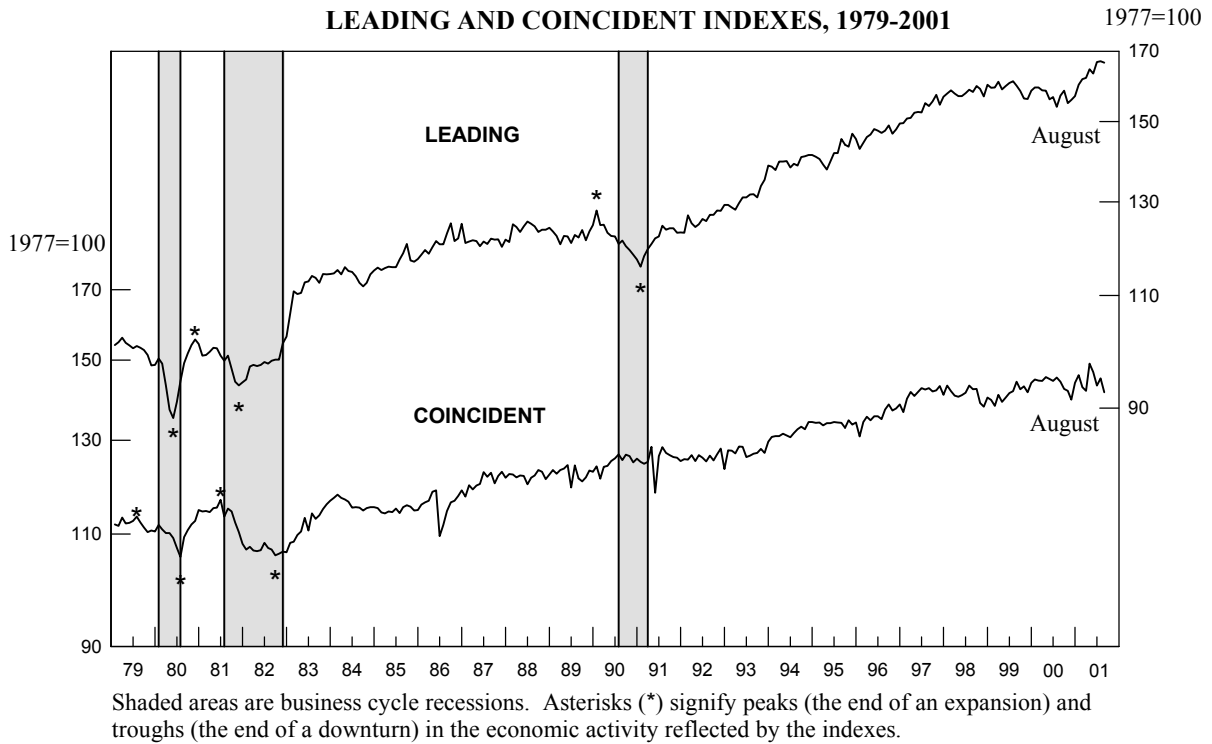


CHART 7.
ALUMINUM MILL PRODUCTS:
LEADING AND COINCIDENT GROWTH RATES, 1979-2001

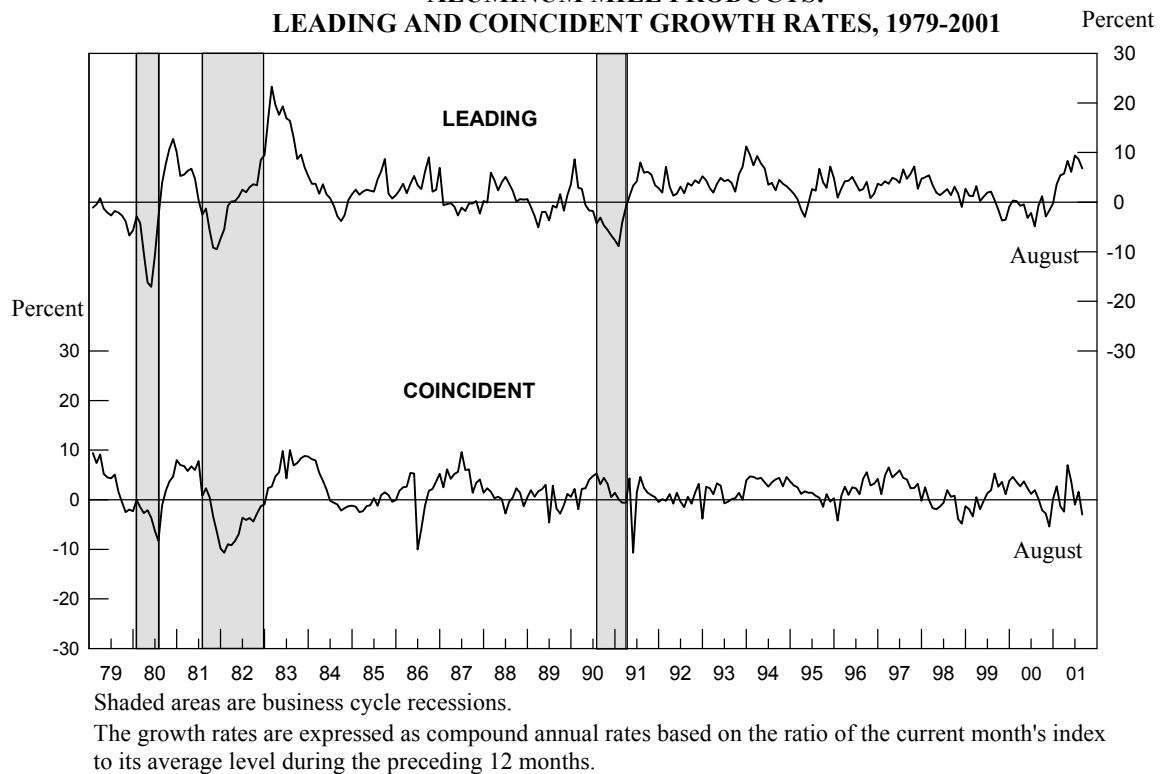


Table 8.
The Copper Industry Indexes and Growth Rates

	Leading Index		Coincident Index	
	(1977 = 100)	Growth Rate	(1977 = 100)	Growth Rate
2000				
September	115.2	-5.3	123.1	-0.1
October	113.2	-7.4	122.2	-1.2
November	113.6	-5.8	122.8	-0.2
December	114.0	-4.3	118.7	-6.2
2001				
January	115.6	-0.9	119.7	-4.2
February	114.2	-2.4	125.1	4.3
March	112.4	-4.9	123.6	1.8
April	111.7r	-5.2r	121.5	-1.3
May	114.2	-0.5	123.1r	1.1r
June	113.7	-0.9r	121.7r	-0.9r
July	114.4r	0.4r	122.2r	0.1r
August	115.0	1.7	123.6	2.1

r: Revised

Note: Growth rates are expressed as compound annual rates based on the ratio of the current month's index to the average index during the preceding 12 months.

Table 9.
The Contribution of Each Copper Index Component to the Percent Change in the Index from the Previous Month

Leading Index	July	August
1. Average weekly overtime hours, rolling, drawing, and extruding of copper (SIC 3351)	0.5r	0.5
2. New orders, nonferrous metal products, (NAICS 3313, 3314, & 335929) 1982\$	0.1	0.0
3. S&P stock price index, building materials companies	0.2	0.1
4. LME spot price of primary copper	-0.3	0.0
5. Index of new private housing units authorized by permit	-0.1	0.0
6. Spread between the U.S. 10-year Treasury Note and the federal funds rate	0.1	-0.1
Trend adjustment	0.0	0.0
Percent change (except for rounding differences)	0.5r	0.5
Coincident Index		
1. Industrial production index, primary smelting and refining of copper (SIC 3331)	0.1r	0.1
2. Total employee hours, rolling, drawing, and extruding of copper (SIC 3351)	0.6r	1.0
3. Copper refiners' shipments (short tons)	-0.4	0.0
Trend adjustment	0.1	0.1
Percent change (except for rounding differences)	0.4r	1.2

Sources: Leading: 1, Bureau of Labor Statistics; 2, U.S. Census Bureau and U.S. Geological Survey; 3, Standard & Poor's; 4, London Metal Exchange; 5, U.S. Census Bureau and U.S. Geological Survey; 6, Federal Reserve Board and U.S. Geological Survey. Coincident: 1, Federal Reserve Board; 2, Bureau of Labor Statistics; 3, American Bureau of Metal Statistics, Inc. and U.S. Geological Survey. All series are seasonally adjusted, except 3, 4, and 6 of the leading index.

r: Revised

CHART 8.
COPPER: LEADING AND COINCIDENT INDEXES, 1979-2001

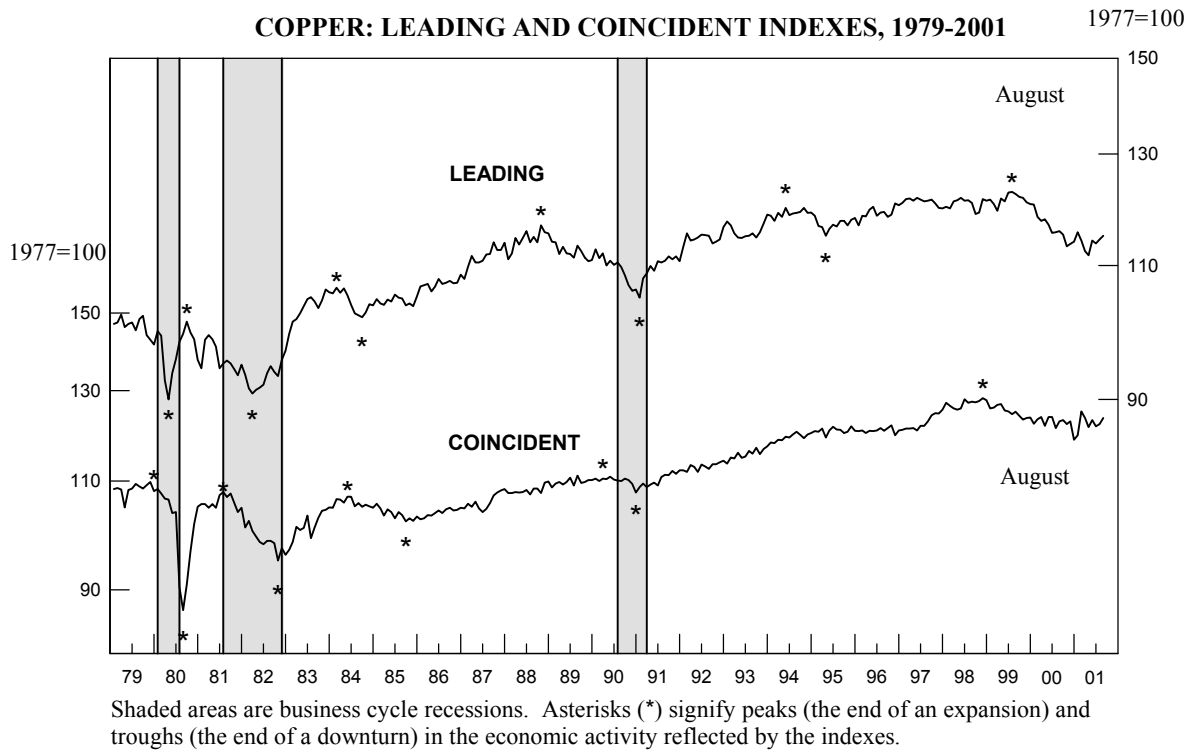
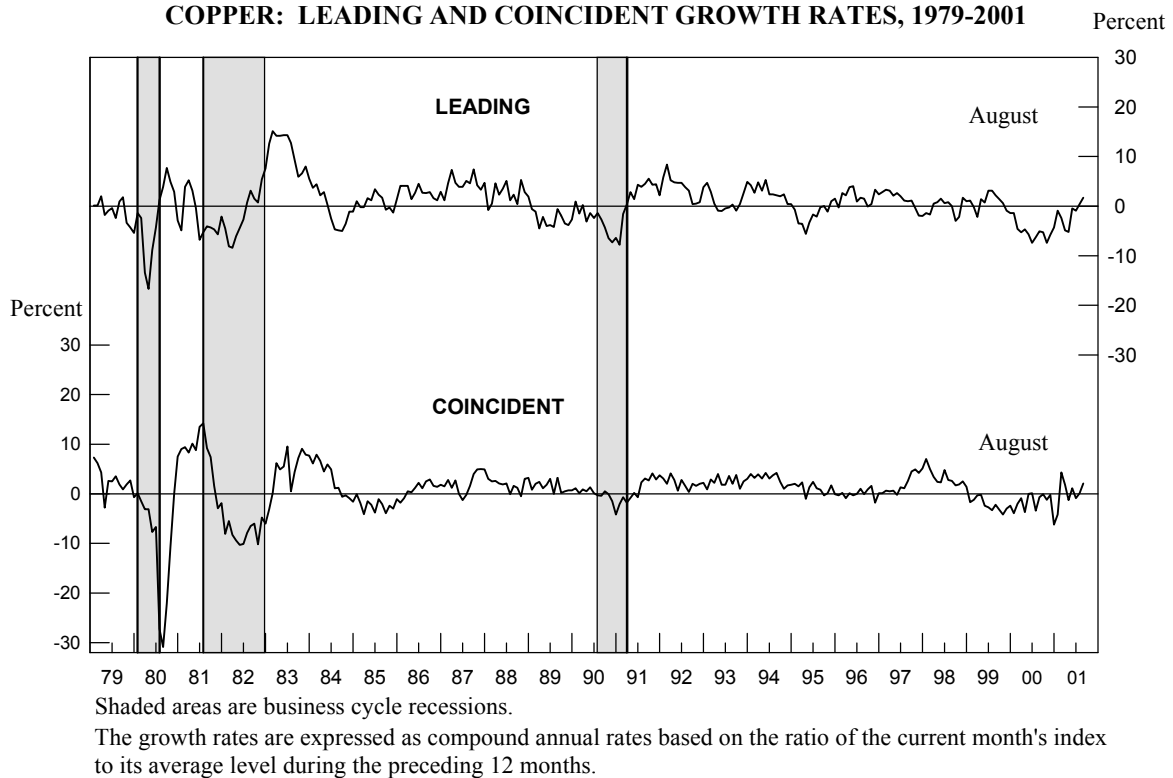


CHART 9.
COPPER: LEADING AND COINCIDENT GROWTH RATES, 1979-2001



Explanation

Each month, the U.S. Geological Survey tracks the effects of the business cycle on five U.S. metal industries by calculating and publishing composite indexes of leading and coincident indicators. Wesley Mitchell and Arthur Burns originated the cyclical-indicators approach for the economy as a whole at the National Bureau of Economic Research in the mid-1930s. Over subsequent decades this approach was developed and refined, mostly at the National Bureau, under the leadership of Geoffrey H. Moore.¹

A business cycle can briefly be described as growth in the level of economic activity followed by a decline succeeded by further growth. These alternating periods of growth and decline do not occur at regular intervals. Composite indexes, however, can help determine when highs and lows in the cycle might occur. A composite index combines cyclical indicators of diverse economic activity into one index, giving decision makers and economists a single measure of how changes in the business cycle are affecting economic activity.

The indicators in the metal industry leading indexes historically give signals several months in advance of major changes in a coincident index, a measure of current metal industry activity. Indicators that make up the leading indexes are, for the most part, measures of anticipations or new commitments to various economic activities that can affect the metal industries in the months ahead.

Composite coincident indexes for the metal industries consist of indicators for production, shipments, and total employee hours worked. As such, the coincident indexes can be regarded as measures of the economic health of the metal industries.

The metal industry coincident indexes reflect industry activity classified by the U.S. Standard Industrial Classification (SIC) and the North American Industry Classification System (NAICS). Of the five metal industries, primary metals (NAICS 331) is the broadest, containing 25 different metal processing industries. Steel, aluminum, and copper are specific industries within the primary metals group.

The SIC was the main vehicle used by the U.S. Government and others in reporting industry economic statistics throughout most of the last century. Starting with the 1997 U.S. Economic Census, the U.S. Government began using the NAICS, which classifies economic data for industries in Canada, Mexico, and the United States. In general, metal industry indexes starting in 1997 begin to reflect the NAICS classification, while indexes for earlier years follow the SIC. Hence, composite indexes from 1997 forward are not entirely consistent with those of earlier years.

The largest change to primary metals because of the NAICS deals with other communication and energy wire manufacturing (NAICS 335929). Under NAICS, this manufacturing has been removed from primary metals and added to electrical equipment, appliance, and component manufacturing. Because monthly shipments and new orders for this wire are not available, the USGS is estimating their values from 1997 onward and adding them to the appropriate metal industry indicators and indexes to maintain consistency.

¹**Business Cycle Indicators, A monthly report from The Conference Board** (March 1996).

There are other small changes to the primary metals industry because of the switch to the NAICS. Coke oven activity not done by steel mills, for example, is removed and alumina refining, a part of industrial inorganic chemical manufacturing under the SIC, is added. Since the historic trends of the composite indexes are not affected by these small changes, the USGS is not making specific adjustments to the indexes for them for the periods before and after 1997.

The metal industry leading indexes turn before their respective coincident indexes an average of 8 months for primary metals and 7 months for steel and copper. The average lead time for the primary aluminum leading index is 6 to 8 months, and the average lead time for the aluminum mill products leading index is 6 months.

The leading index of metal prices, also published in the *Metal Industry Indicators*, is designed to signal changes in a composite index of prices for primary aluminum, copper, lead, and zinc traded on the London Metal Exchange. On average, this leading index indicates significant changes in price growth about 8 months in advance.

The growth rate used in the *Metal Industry Indicators* is a 6-month smoothed growth rate at a compound annual rate, calculated from a moving average. Moving averages smooth fluctuations in data over time so that trends can be observed. The 6-month smoothed growth rate is based upon the ratio of the latest monthly value to the preceding 12-month moving average.

$$\left[\left(\frac{\text{current value}}{\text{preceding 12-month moving average}} \right)^{\frac{12}{6.5}} - 1.0 \right] * 100$$

Because the interval between midpoints of the current month and the preceding 12 months is 6.5 months, the ratio is raised to the 12/6.5 power to derive a compound annual rate.

The growth rates measure the near-term industry trends. They, along with other information about the metal industries and the world economy, are the main tools used to determine the outlook of the industries. A 6-month smoothed growth rate above +1.0% usually means increasing growth; a rate below -1.0% usually means declining growth.

The next summary is scheduled for release on MINES FaxBack at 10:00 a.m. EST, Friday, November 16. Access MINES FaxBack from a touch-tone telephone attached to a fax machine by dialing 703-648-4999. The address for *Metal Industry Indicators* on the World Wide Web is: <http://minerals.usgs.gov/minerals/pubs/miil>

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